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## Water: a key resource for sustainable development*

### Report of the Secretary-General

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# I. Introduction

1. The present report reviews the implementation of and challenges posed by chapter 18 of Agenda 21, Protection of the quality and supply of freshwater resources. It focuses on the current status of freshwater resources and services, taking into account cross-cutting issues throughout Agenda 21, and the essential water stewardship components that need to be in place for implementing integrated water resource management.

2. Water is a finite natural resource necessary for the sustenance of life and ecological systems and a key resource for social and economic development. Despite improvements in water-use efficiency, particularly in developing countries, the use and demand for freshwater and the incidence of water pollution have increased as a result of population growth and expanding economic activities. During the past decade access to safe water supply and adequate sanitation has barely kept pace with population growth, and the demand for water, food and fibre production is on the increase.

3. In order to meet basic human and ecological needs and services, societies need to address and solve several serious challenges, including the intensified use and abuse of finite and vulnerable water resources and their unequal geographical distribution; and inadequate and inequitable investments in human and institutional capacity-building as well as inappropriate investments in infrastructure for water services, including sanitation.

4. In the next two decades it is estimated that water use by humans will increase by 40 per cent, and that 17 per cent more water will be needed to grow food for growing populations in developing countries. One third of the countries in water-stressed regions of the world are expected to face severe water shortages in this century. By 2025 there will be approximately 6.5 times as many people, or 3.5 billion, living in water-stressed countries than in 2000. The increasing pollution and depletion of surface and groundwater resources exacerbate the situation. It is estimated that more than half of the world's major rivers are seriously polluted and depleted. It is also necessary to allocate adequate water resources to sustain ecological functions and systems.

5. The United Nations Millennium Assembly Declaration sets the goal of halving the number of people who are unable to reach or to afford safe drinking water by 2015. The Declaration also aims at discontinuing the unsustainable exploitation of water resources by developing water management strategies, at the regional, national and local levels, that promote both equitable access and adequate supplies. Currently at least 1.1 billion people lack access to safe water supply, and almost 2.5 billion lack adequate sanitation, with the predominant majority living in developing countries. To meet the Millennium Assembly water supply target, an additional 1.6 billion people will require access to safe water. To halve the proportion of people without access to adequate sanitation would require that another 2.2 billion people be provided with facilities by 2015.

# II. Strategic approaches to sustainable water development and management

## A. The need for an integrated approach to freshwater resources

6. Since the United Nations Conference on Environment and Development (UNCED) in 1992, the international community has made considerable effort to raise awareness about water resources concerns and management. The UNCED integrated water resources management principles (chapter 18 of Agenda 21) have been elaborated upon and refined by several other international water meetings, including, the United Nations Expert Group Meeting on Strategic Approaches to Freshwater Management and the Commission on Sustainable Development at its sixth session (1998). However, despite many major international water meetings that have had an impact on the formulation of integrated national water policies and programmes, the implementation of integrated water resources management has not been fully achieved in either developed or developing countries. Water management issues continue to be dealt with on the basis of fragmented sectoral approaches.

7. A supply-side approach, in combination with weak and fragmented institutional structures, still prevails in many countries, as water-related services are extended to promote public health and food

production. There is a growing consensus that integrated water resources management and demand-driven approaches offer more effective means of providing water for human consumption, development activities and food production, while alleviating the stress on the in situ ecological goods and services that are provided by freshwater. The focus on integrated water resources management and demand-driven approaches to management mark an important shift in thinking about how water is managed in terms of allocation coherency, efficiency, equity and service delivery.

8. It is now accepted that sustainable water development and management require the integration of social and economic concerns with environmental ones. Land-use planning and the sustainable management of forests, wetlands, mountains, oceans and coastal areas are important elements of the equation, since water and the water cycle are fundamental for all processes occurring in the biosphere. Land-based and aquatic ecosystems are water-dependent and particular importance must be given to the most vulnerable ecological areas. Environmental protection and concern should have a high priority for both upstream and downstream water resources allocation. Such concerns should also be applied to the construction of dams and water reservoirs which often serve multiple purposes for energy generation, flood control, irrigation, drinking water, recreation and navigation. Dams and reservoirs are associated with many social and environmental costs that have to be accounted for.

9. The increased incidence of natural and related environmental and technological disasters, triggered by earthquakes, volcanic eruptions, landslides, floods, drought and tropical storms, has resulted in significant human, social and economic losses, posing a major threat to the planet. Climate change, environmental degradation, population increase, rapid urbanization and industrialization and increasing poverty make societies more vulnerable to disasters. The recently released report of the Intergovernmental Panel on Climate Change foresees that global temperatures will rise faster and higher than previously predicted, causing an accelerated rise in sea level, with drought and floods as some of the consequences. Millions of people may be forced from low-lying coastal areas, while others may be driven from their land because of increasing temperatures and drought. The negative impact of these events serves as a major obstacle to the achievement of sustainable development. It is important to develop risk management and disaster reduction systems and to put in place early warning and monitoring systems and emergency preparedness measures in the most disaster-prone areas.

10. It is recognized that, in order to realize the potential of integrated water resources management, adequate funding, human and institutional capacity-building, and a realistic assessment of hydrological and other physical resources are required. These need to be combined with information dissemination and application of appropriate technological solutions and transfers, particularly for areas in developing countries that are already water-scarce. The process of transforming a fragmented water sector into a new strategic integrated one has been successful in some developing countries, particularly where they have benefited from coherent external development cooperation in capacity-building and in institutional strengthening at national, basin and local levels.

## B. The role of stakeholders

11. During the past decade there has been an increasing recognition of the need to delegate water resources management to the lowest appropriate level and to promote public/private partnerships as a way to make more efficient and productive use of water resources. The major groups, including non-governmental organizations, farmers, local authorities, the scientific and technological community, business and industry, trade unions, indigenous people, children and youth and women, have become an integral part of the sustainable development and management of water resources at the international, national and local levels. The roles and achievements of the major groups have varied. For example, many non-governmental organizations have been more successful in building community awareness and local capacity than in providing technical support for water assessments, water supply and sanitation. Attempts to encourage the transfer of operation and maintenance to water-user associations have had mixed results, since the generally low economic returns on irrigated agriculture and uncertain land tenure provide little incentive for farmers to make long-term capital investments. At the international and national levels the Global Water

Partnership (GWP) is promoting and supporting various integrated water resources activities.

12. The potential for increased private intervention is considerable with regard to the provision of services to more affluent urban areas of developing countries. However, private-sector participation in the extension of services to the poor in urban and rural areas remains more problematic, hinging on pricing and cross-subsidy policies that would enable the private sector to generate a fair return on its investments. On average, only 30 per cent of the costs for water services are now recovered in developing countries. Irrigated agriculture, particularly large- and medium-scale schemes, and industrial water continue to rely upon government regulations and subsidies for the provision of low-cost water services.

13. While national and local governments are shifting from the provision of services to the promotion of an enabling environment, their overall role should not be diminished. If autonomous public and private utilities are to succeed in providing services and more efficient water use by all sectors, the existence of a stable and coherent regulatory environment is required. Water laws have been enacted in many countries, but some still lack a water resources law. In many cases there is a lack of political will to enforce water legislation; resources and other means needed are also scarce.

## C. Information for decision-making

14. Freshwater is highly variable in time and space. Its quantity, quality and sectoral allocation and use need to be coherently and continuously monitored and managed. The collection of hydrological, meteorological, hydrogeological, ecological and socio-economic information for water resources assessment and monitoring is essential for informed decision-making. Recent developments in information and communication technologies are fundamental for the dissemination of scientific and technological knowledge. Important progress in organizing information retrieval and diffusion has been made possible by technologies, such as geographic information systems (GIS) and computerized databases of water resources and related socio-economic information. Such technologies, combined with capacity-building, still have to be made available on a much larger scale in developing countries. Despite innovative information technologies, data collection at the field level remains crucial for sound and accurate water resource and management assessments. Unfortunately, it is often disregarded. Financial constraints have reduced the ability of public service institutions in charge of water resources to collect data at the field level in many developing countries. In many cases there has been a decline in the quantity and quality of information on water resources, and their uses.

15. Following the request of the Commission on Sustainable Development at its session for a periodic assessment of strategic approaches to freshwater development and management, the ACC Subcommittee on Water Resources is preparing, with the support of donors, a world water development report. The report aims to provide continuous and systematic qualitative and quantitative water resources assessments and analyses of critical problems related to water resources stewardship. It will, to a great extent, be based on socio-economic, hydrological, meteorological and hydrogeological data compiled by United Nations agencies.

## D. International cooperation and national mechanisms for institutional capacity-building

16. There is no single international institution that deals exclusively with water resources issues. Those issues are by their nature cross-cutting and multidisciplinary, and any international institutional set-up must deal with a wide range of related environmental, social and economic questions at all levels. Taking this into account, there is need for international organizations involved in the water sector to further prioritize coordination, collaboration and integration of work.

17. During the past decade there has been increasing awareness of the need for riparian States to cooperate on matters related to shared water resources and on integrated water resource management strategies. Such cooperation should take into account agreements that are of relevance to water issues, such as the United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change, and the Convention on

Wetlands of International Importance, Especially as Waterfowl Habitat (Ramsar Convention).

18. Another related issue is the strengthening of international cooperation in the areas of finance, institutional and human capacity-building, research and information-sharing and technology transfer. Technical cooperation is an important tool to support regional, national and local integrated water resources activities in developing countries. Equally important is to strengthen South/South cooperation schemes, taking advantage of all new developments and opportunities for cooperation among Governments, the private sector, non-governmental organizations, multilateral organizations and local communities.

19. During the 1990s, the execution of certain technical cooperation projects of the United Nations system shifted from United Nations agencies to national agencies, in an effort to build up and strengthen governmental institutions. United Nations agencies now play more of a support role, providing, at the request of Governments, technical assistance in capacity-building and strengthening water resources institutions. That support is considered by many developing countries to be an important element in implementing integrated water resources management.

### E. Finance for sustainable water development and management

20. Financial commitments to water supply and sanitation have overall remained unfulfilled. Even though some developing countries have increased public spending in the sector, the gap between the levels of investment needed to achieve full water and sanitation coverage and the levels of investment actually made is considerable. Recent estimates suggest that Governments in developing countries spend some US$ 10-25 billion annually on water supply and sanitation, with a major portion being spent on higher-level services in urban centres. An additional $25 billion was spent by private investors on water and sanitation infrastructure in developing countries between 1990 and 1997. Strikingly, investments made to the urban water-supply sector have not even been sufficient to prevent the decline in relative coverage, let alone the substantial increase in the number lacking access to safe water supply. It is also important that adequate resources be made available for improving water resources management structures.

21. In recent years the international system has witnessed a decline in official development assistance (ODA) and an increase in foreign direct investment (FDI). The potable water supply sector has not been able to attract sufficient FDI funds, partly because of low-cost recovery. The difficulty of involving the private sector shows that public funding is still crucial for water-sector investments. The trend of declining ODA and difficulties of tapping into FDI are disturbing, especially in view of the massive investments that will be required to halve the number of people without safe water supply by 2015.

22. It is evident that both internal and external resources have to be generated en masse if an integrated water resources approach and universal safe water and adequate sanitation are to be realized in the foreseeable future. Although some developing countries witnessed significant economic growth during the 1990s, they were unable to achieve major increases in water supply and sanitation service coverage. Their ability to increase internal funds as well as external loans was clearly undermined by high levels of external debt.

## III. Sustainable water development and management in a cross-sectoral context

### A. Sustainable agriculture and rural development

23. Water is increasingly seen as a key factor in food production. Approximately 70 per cent of the world's exploited freshwater resource base is diverted to agriculture. The remaining 30 per cent is used by households and industry. The competition for water of sufficient quantity and quality is intensifying as water resources development opportunities become more constrained in many countries. It is acknowledged that an improvement in water-use efficiency, combined with increased water availability, is essential to meeting present and future water needs for increased food production. Although some progress has been made in increasing the efficiency of agricultural water use in public irrigation systems, only 30 per cent of the water supplied is actually used by crops and plants. More efficient technologies, being used by some countries, have proved effective in reducing water use. Yet many

countries are approaching water-scarcity conditions. Few are equipped with the financial and institutional means to ensure food security, either through food importation or more efficient management of agricultural production and food demand. Given that the number of water-scarce and food-deficit countries is on the increase, serious concerns have to be raised about where food, and the water to grow it, are going to come from. This implies that international, national and local trade systems and markets will face new commercial and financing challenges.

## B. Promoting sustainable development of human settlements

24. It is estimated that by 2015, more than 50 per cent of the population in developing countries will live in urban areas. This urban growth poses a number of institutional, economic and environmental challenges for maintaining and extending services and for maintaining and improving water quality, especially sewage water treatment. In terms of water supply and sanitation, some progress has been made in the past decade. From 1990 to 2000 the percentage of the total population in developing countries with access to safe water increased from 72 to 78, whereas for sanitation it increased from 42 to 52. In most urban water systems in developing countries, water that is unaccounted for amounts to as much as 50 per cent of total withdrawals. To achieve the international targets of reducing by half the proportion of people without access to water and adequate sanitation, it is estimated that more than 1 billion people will need to be served with a water supply and almost 1.1 billion people served with adequate sanitation in urban areas. Even though urban areas are expected to accommodate more people than rural areas, there will be a steady increase in the absolute number of the world's rural population over the next 20 years. The overall growth in population, coupled with the demographic transition to urban areas, will have several socio-economic implications and will further intensify competition both within the urban and rural settings and between urban and rural water uses.

## C. Combating poverty

25. The provision of safe and reliable water supply and sanitation services is key in maintaining public health, productivity and the dignity of poor populations. Bulk water services for agricultural and industrial activities are also essential in promoting employment and income-generation among low-income groups. These services continue to be heavily subsidized in both developed and developing countries. But in some cases, due to the shifting role of Governments from service providers to promoters of an enabling environment, central and local governments are progressively withdrawing, without an appropriate transition period, from the provision of water services, leaving some parts of the population without services. In these cases, poor people may become increasingly exposed to water shortages, leading to public health risks and economic hardship. A disturbing fact is that poor people with the most limited access to water supply services often have to pay private water vendors more for water than those connected to municipal supplies. Figures from the United Nations Centre for Human Settlements and the Water Supply and Sanitation Collaborative Council for some cities in Africa, Latin America and Asia show that poor people without municipal connections have to pay approximately 5-28 times more per water unit. In addition, poor people relying on private water vendors are provided with water of non-guaranteed quality.

## D. Social aspects of sustainable water development and management

26. Promoting and facilitating human resources development, particularly for women, indigenous peoples and local communities, is a necessary but not sufficient prerequisite for efficient water resources management. Human capacity-building through education and training should, to a much greater extent, be combined with institutional capacity-building. By excluding women, indigenous peoples and local communities in education and health programmes and in managerial and administrative functions, the facilities installed may not suit their requirements or take advantage of their potential as managers and operators. Hence, basic knowledge of water resources development and practices applicable for local conditions, particularly among women, should play a significant role in how local water resources are managed. There is also a simultaneous need for institutional capacity-building to promote autonomous agencies responsible and accountable for integrated water resources management and to support transparent

decision-making processes and division of responsibilities.

## IV. Sustainable water development and management challenges

27. The task ahead is to determine how Governments, the private sector and civil society, with the support of the United Nations system, will meet the social, economic and ecological challenges posed by the increased and intensified use and abuse of finite and vulnerable water resources and the necessary expansion of access to safe water supply and adequate sanitation facilities for social and economic activities. A minimum flow of water resources is also required to sustain ecological integrity, particularly in ecologically vulnerable areas. The integrated water resources management approach is instrumental in dealing with these challenges. In promoting and facilitating sustainable water development and management, it is paramount:

(a) To promote social stability and adaptability to environmental change, by applying integrated water resources management strategies, disaster reduction schemes and equitable and efficient allocation and distribution of water resources;

(b) To promote and raise awareness, and to build human and institutional capacity, through participation by stakeholders and partnerships among riparian States and between national and local user-sectors and the public and private sector;

(c) To provide access to safe water supply and adequate sanitation for poor people as an essential component in poverty alleviation measures, with a view to improving health, economic productivity, food security and human dignity;

(d) To protect the quality of surface and groundwater and aquatic ecosystems;

(e) To strengthen international institutional arrangements, demand-driven technical cooperation and financing for sustainable water resources development and management;

(f) To strengthen the enabling role of Governments to enact and enforce water legislation and strengthen local water management and service capacities.